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C-A OPERATIONS PROCEDURES MANUAL

1.6 Mechanical System(s) Safety Implementation

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Hand Processed Changes

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Approved: _____ **Signature On File** _____
Collider-Accelerator Department Chairman Date

J. Tuozzolo

1.6 Mechanical Systems(s) Safety Implementation

1. Purpose

This procedure specifies how members of the C-A shall implement DOE and BNL policy for safely designing, assembling, installing, and operating mechanical equipment.

2. Responsibilities

- 2.1 The C-A Chief Mechanical Engineer shall ensure that this procedure is implemented.
- 2.2 All personnel in the C-A shall cooperate in the execution of this procedure.
- 2.3 C-A Supervisors shall be trained as to the requirements of this procedure, where applicable, they shall ensure conformance to its standards.

3. Prerequisites

- 3.1 C-A Supervisors of groups performing applicable work shall also be familiar with the contents of the BNL ESH Standard Manual Sections 1.4.0, 1.6.0, 1.6.1, and 4.3.0 and the existence of OSHA requirements stated in 29 CFR 1910 subparts I (Personal Protective Equipment), M (Compressed Gas & Compressed Air Equipment), N (Material Handling & Storage), O (Machinery & Machine Guarding), P (Hand & Portable Power Tools etc.) and Q (Welding, Cutting & Brazing), which may be consulted on the web..
- 3.2 C-A Supervisors shall be trained in the requirements of [C-A-OPM 2.28](#), "Enhanced Work Planning".

4. Precautions

None

5. Procedure

- 5.1 C-A Supervisors shall ensure that all jobs that they assign are reviewed in accordance with the ESH criteria in [C-A-OPM 2.28](#), Enhanced Work Planning.
- 5.2 C-A Supervisors shall ensure that all Material Handling Equipment meets the standards specified in BNL ESH Standard 1.6. This includes compliance with the DOE Hoisting and Rigging Manual.
- 5.3 C-A Supervisors shall ensure that all Crane and Forklift operators and Riggers under their purview have a valid Safety Awareness Certificate (SAC) card, are "checked out"

on the equipment they are operating, and that a record is kept which documents their training.

- 5.4 C-A Supervisors shall ensure that all cutting, welding, and brazing work is being performed in accordance with BNL ESH Standard 4.3.0. All cutting and welding work shall be done only in permitted areas. If it becomes necessary to perform such work outside of such zones the Supervisor shall obtain a review by the BNL Fire and Rescue group and obtain a Cutting/Welding permit, BNL #F2230B.

- 5.5 C-A Department Design Reviews.

All new projects, major pieces of equipment, and major modifications to existing equipment shall be reviewed by the C-A Safety Review Committee or the C-A Experimental Safety Review Committee and/or the C-A ALARA Committee. The C-A Chief Mechanical Engineer or designee shall be a member of these committees to cover mechanical safety criteria. It is the responsibility of the project engineer/physicist, the Group Leader assembling the equipment, and the C-A Chief Mechanical Engineer to ensure that all equipment has been properly reviewed.

Any design changes shall be documented on an Engineering Change Notice (ECN). Reference C-A-QAP-603, Configuration Management. The C-A Chief Mechanical Engineer shall be responsible for determining whether further review is required by the Department Committees for minor changes and modifications. This determination will be made in consultation with the committee heads if necessary.

- 5.6 Certification of Mechanical Equipment.

The Chief Mechanical Engineer in accordance with [C-A-OPM 9.2.3](#), shall certify new devices or equipment that require further review for design safety or to prevent damage to equipment.

- 5.7 C-A Mechanical Design Drawings and Specification Approval.

In order to assure compliance with section 5.5 above all fabrication, assembly, and installation drawings and specifications for C-A mechanical equipment must be reviewed and approved by the C-A Chief Mechanical Engineer or designee. Reference [C-A-QAP-601](#), Preparations & Issuance of Engineering Drawings/Specifications.

- 5.8 Safety Inspections.

The C-A Safety Inspection Committee conducts safety inspections of all areas on a regular basis. The C-A Chief Mechanical Engineer shall assign at least one member to each committee group who will accompany the inspections tours. This member shall aid in the inspection of mechanical equipment. A list of findings from the inspections shall be sent to the C-A Chief Mechanical Engineer by the Committee Head or designee. If an item or finding requires a mechanical engineering review or certification, than a memo shall be sent to the C-A Chief Mechanical Engineer by the Committee Head requesting the review.

6. Documentation

- 6.1 The C-A Mechanical Design Group maintains approved drawings and specifications. The C-A Chief Mechanical Engineer maintains equipment certification documentation.
- 6.2 SAC Cards are issued and documented by BNL S&HSD Training Office.

7. References

- 7.1 [C-A-OPM 2.28, "Enhanced Work Planning".](#)
- 7.2 [C-A-OPM 9.2.3., "Procedure for Chief Engineers to Certify Conformance of Devices".](#)
- 7.3 BNL ES&H Standard Manual Sections 1.6 and 4.3.0
- 7.4 OSHA Regulations: 29 CFR 1910 subparts I, M, N, O, P, and Q.
Can be accessed on this web site:
<http://www.access.gpo.gov/nara/cfr/cfr-table-search.html>

8. Attachments

None.